RADIOACTIVE MATERIALS USAGE SURVEY FOR POINT SOURCES

Purpose

This Meteorology and Air Quality Group (MAQ) procedure describes the Radioactive Materials Usage Survey for Point Sources (monitored and unmonitored) including the method for estimating radioactive materials usage, reviewing ESH-IDs and Air Quality Reviews (AQRs), and evaluating previously monitored and previously contaminated release points.

Scope

This procedure applies to developing usage data, reviewing ESH-IDs/AQRs, and evaluating historic release data for release points with the potential to emit radionuclides to the air.

In this procedure

Hazard Control Plan

The hazard evaluation associated with this work is documented in HCP-MAQ-Office Work.

Signatures

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Approved by: Dave Fuehne, Rad-NESHAP Project Leader	Date: 7/31/02
Approved by: Terry Morgan, Quality Assurance Officer	Date: 7/31/02
Approved by: Jean Dewart, RRES-MAQ Group Leader	Date: 8/01/02

02/03/04

General information about this procedure

Attachments

This procedure has no attachments.

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description of Changes
0	8/1/95	New document.
1	6/9/98	Process and management changes.
2	3/31/00	Process revised, parts of process moved to MAQ-137 and -138.
3	8/2/01	Quick-change revision to clarify overview.
4	8/19/02	Quick-change revision to remove definition of inventory and remove redundant instruction to request meeting in step 1.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- MAQ personnel assigned to perform all or part of this procedure.

Personnel previously trained to revision 3 of this procedure do not require retraining to this revision.

Training method

The training method for this procedure is **"self-study" (reading)** and is documented in accordance with the procedure for training (MAQ-024).

Annual retraining is required and will be by self-study ("reading").

General information, continued

Definitions specific to this procedure

Point source: A source of air emissions that meets the following criteria:

1. The release point must be stationary,
   AND
2. The effluent discharged from the operation or building must be "actively exhausted through a forced ventilation system via a single point" (FFCA),
   AND
3. The operation must have the potential to emit radionuclides "based on the discharge of the effluent stream that would result if all pollution control equipment did not exist, but the facility operations were otherwise normal" (40 CFR 61.93(b)(4)(ii)).

Usage/throughput: For all release points, usage/throughput represents the actual amount (or an estimate of the actual amount) of radioactive materials or radionuclides (RAM) that is used in normal operations. This definition is expanded to encompass duct holdup, residual contamination, and/or historic monitoring data if they are applicable.

References

The following documents are referenced in this procedure:

- MAQ-024, "Personnel Training"
- MAQ-126, "Performing a Radioactive Materials Usage Survey Interview"
- MAQ-137, "Evaluating Potential Emissions and Potential Effective Dose Equivalent from Radionuclide Processes"
- MAQ-RN, "Quality Assurance Project Plan for the Rad-NESHAP Compliance Project"
- Memo ESH-17:00-160, "Position Paper on Removing Certain Point Sources From the Usage Survey Report," from Sue Terp, March 3, 2000.
- 40 CFR 61, "National Emission Standards for Hazardous Air Pollutants"
- Current Radioactive Materials Usage Survey for Point Sources
- Marshall Report, "SNM Holdup Assessment of Los Alamos Exhaust Ducts," Final Report LA-12700, Robert S. Marshall, February 1994.

Background

Background

As required by 40 CFR 61, Subpart H, LANL must monitor any point source with the potential to contribute a PEDE of 0.1 mrem/yr or greater to any member of the public. The regulation further requires that LANL perform periodic confirmatory measurements to verify the low emissions from unmonitored point sources. LANL uses data from its Radioactive Materials Usage Survey for Point Sources (**Note**: Prior to 1997, this survey was called 199x Radionuclide Point Source Inventory) to evaluate a point source against these criteria.

This procedure is closely associated with two other MAQ procedures. First, MAQ-126, "Performing a Radioactive Materials Usage Survey Interview" describes how to conduct a Usage Survey interview. Second, MAQ-137, "Evaluating Potential Emissions and Potential Effective Dose Equivalent from Radionuclide Processes" describes how MAQ (1) calculates emissions and PEDE for comparison with 0.1 mrem/yr and (2) evaluates the suitability of existing sampling systems.

This procedure is intended only as a generic guide -- all possible considerations cannot be included, and some which are included may not apply in all cases. Good engineering judgment and health physics practices must be applied in the use of this procedure.

Collecting radioactive materials usage and process description data

Radioactive materials survey overview

MAQ uses data from the Radioactive Materials Usage Survey for Point Sources to periodically verify and confirm low emissions from unmonitored point sources. This methodology was identified in the FFCA as part of LANL's process to demonstrate compliance with 40 CFR 61, Subpart H. MAQ also uses data from the Usage Survey to evaluate the suitability of existing sampling equipment on monitored release points. MAQ-137, "Evaluating Potential Emissions and Potential Effective Dose Equivalent from Radionuclide Processes", describes how MAQ uses the survey data.

A survey of radioactive material usage/process information is initiated according to the schedule in MAQ-RN. The survey is developed by MAQ and/or facility personnel. The information collected is based on current, active operations at each release point of interest. Process information is also collected in order to conservatively estimate potential emissions and dose from monitored and unmonitored release points at LANL (discussed further in MAQ-137).

Steps to collect usage and process description data

To initiate a usage survey and collect usage and process description data, perform the following steps:

Step	Action
1	Contact the Facility Manager (FM) and/or the designated point of contact (POC) for the facility to inform them that an updated survey is required and will soon begin.
2	If deemed necessary, schedule and conduct a meeting between MAQ survey personnel and the POC or FM to discuss how the survey will be performed. If a meeting is not deemed necessary, go to Step 4.
3	MAQ personnel will perform and document a survey according to procedure MAQ-126. If discrepancies and/or incomplete information are identified, MAQ survey personnel will conduct additional interviews to resolve discrepancies and/or obtain necessary information. These interviews may be conducted via telephone, e.mail, or site visits. Go to Step 8.
4	MAQ survey personnel will mail a copy of the most recent MAQ survey to the appropriate POC.

Steps continued on next page.

Collecting radioactive materials usage and process description data, continued

Step	Action
5	After the materials have been received by the POC, if necessary, schedule and conduct a meeting with the POC to provide instruction/guidance on the survey process and those items that are of interest. Provide specific guidance on survey information collection (as described in MAQ-126).
6	After receiving the survey information from a facility, compile updated survey information and identify discrepancies and/or incomplete information.
7	If discrepancies and/or incomplete information are identified, conduct additional interviews to resolve discrepancies and/or obtain necessary information. These interviews may be conducted via telephone, e.mail, or site visits. Go to Step 8.

Review of ESH-ID/AQR

ESH-ID/AQR review overview

Additional review steps have been implemented into the Usage Survey update in order to assure that the current survey captures new and modified operations with radioactive materials at LANL facilities. The Air Quality LIR (LIR404-10-01.1) requires that facility representatives either conduct an air quality review themselves, submit an ESH-ID for review, or contact MAQ if they are starting a new rad operation or modifying an existing rad operation. MAQ New Source Review (NSR) personnel regularly conduct Air Quality Reviews (AQRs) and/or review ESH-IDs for rad and non-rad air emissions issues.

Steps to review ESH-IDs and AQRs

To conduct this type of review, NSR personnel compile ESH-ID/AQRs that include operations with radioactive materials on a monthly basis and provide them to Usage Survey personnel.

Step	Action
ESH-ID/AQR Review:	
8	On a monthly basis during the calendar year of interest, review ESH-ID/AQRs provided by NSR personnel. Summarize and chart review by identifying potential unmonitored and monitored point source issues versus non-point source issues by FMU, TA, and building.
9	For each FMU, conduct additional interviews (can be phone calls and/or e.mails) with facility representatives and/or operations personnel as necessary to determine the status of ESH-ID/AQRs that were identified during the review process. This step can be done during the calendar year of interest or during the spring of the following calendar year, when the final usage survey data are received from facility representatives.
10	Incorporate any relevant information acquired during ESH-ID/AQR review into the current usage survey update.
11	Use these data to supplement survey data and to identify sources which do not need to be reported on further (see memo ESH-17:00-160).

Review of duct holdup data

Duct holdup data overview

The survey data includes information about radioactive materials that are actively used in processes as well as materials which, after years of use, may remain in the facility as duct holdup or residual contamination. The usage data plus process information provided by facility personnel is used to estimate usage and emissions for each release point.

In addition to actual usage data, there are several other elements influencing potential emissions and they must, therefore, be included in the usage data development. Those elements include: historic monitoring data, actual or potential duct holdup data, and actual or potential room/area contamination data. When applicable, each of these elements may be evaluated when compiling point source data.

NOTE: The processes described in steps 12 through 19 do not need to be repeated during each usage survey update. For example, in 1997 a duct holdup determination was made for TA3-66, ES-01. The circumstances have not changed since that determination so that line item remained in the following year's Usage Survey Reports. Based on information from facility representatives and best health physics practices, it will be determined if these steps need to be performed/repeated during each usage survey update.

Steps to develop duct holdup data

The duct holdup data may be derived from three sources of information. For historically (but not currently) monitored release points, historic monitoring data will be used to represent "potential duct holdup." For release points not previously monitored, information derived from facility personnel will be used to estimate "potential duct holdup." For currently monitored release points, the historic monitoring data may be reported in the Usage Survey as an estimate of potential duct holdup.

For previously monitored release points, go to step 12. For release points not previously monitored, go to step 16.

Step	Action
12	Obtain emissions data for point sources with previously-removed sample systems. The primary source of data will be gross alpha/beta results. In general, the last 2-4 years of monitoring data will be sufficient.
13	Based on process knowledge and/or isotopic analyses (where available), determine what radionuclides are present. Only long-lived ($t_{1/2}$ > 1 year) radionuclides should be considered.

Steps continued on next page.

Review of duct holdup data, continued

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>14</td><td>Determine the type of pollution control in place on the release point.
<table>
<tr><th>If pollution control is</th><th>multiply reported emissions by</th></tr>
<tr><td>One stage HEPA filter</td><td>2000</td></tr>
<tr><td>Two stage HEPA filter</td><td>2000*2000</td></tr>
<tr><td>X stage HEPA filter</td><td>2000^{x}</td></tr>
<tr><td>Aerosol or roughing filter</td><td>5</td></tr>
<tr><td>None</td><td>1</td></tr>
</table></td></tr>
<tr><td>15</td><td>Step 14 provides total potential emissions that could have occurred without pollution controls.</td></tr>
<tr><td>16</td><td>Identify any historic duct holdup issues (from previous survey updates) or current, potential duct holdup issues at the facility through interviews with facility representatives. Quantifying duct holdup can be extremely difficult and expensive, and estimates are not always available.</td></tr>
<tr><td>17</td><td>Are previous duct holdup estimates available (refer to documentation for previous inventories/usage surveys, or the Marshal report, 1994).
<table>
<tr><th>If duct holdup estimates…</th><th>then…</th></tr>
<tr><td>are available and the data is still valid (i.e., duct or ventilation system has not been capped and/or turned off):</td><td>leave the data in, or add the data to, the current survey update, as appropriate. Go to next chapter of this procedure.</td></tr>
<tr><td>are not available…</td><td>continue with Step 18.</td></tr>
</table></td></tr>
</table>

Steps continued on next page.

Review of duct holdup data, continued

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>18</td><td>Using best professional judgment, do other reasons warrant a duct holdup review? If unsure, contact the Rad-NESHAP Project Leader.
<table>
<tr><th>If a duct holdup review is…</th><th>Then…</th></tr>
<tr><td>Warranted</td><td>contact the facility manager and ask that a duct holdup study be conducted, documented, and forwarded to MAQ. If a duct holdup investigation is not feasible, use best engineering judgment to estimate maximum potential duct holdup. Continue with Step 19.</td></tr>
<tr><td>not warranted</td><td>go to next chapter of this procedure.</td></tr>
</table></td></tr>
<tr><td>19</td><td>Incorporate the duct holdup information into the current survey update. Include documentation of calculations and assumptions used to arrive at the estimate.</td></tr>
</table>

Review of residual contamination data

Usage data development overview

As stated previously, the survey data include information about radioactive materials that are actively used in processes as well as materials which, after years of use, remain in the facility as contamination or as duct holdup. The usage data plus process information provided by facility personnel are used to estimate usage and emissions for each release point.

In addition to actual usage data, historic monitoring data, and actual or potential duct holdup data, and actual or potential room/area contamination data may also impact potential emissions. When applicable, each of these elements may be evaluated when compiling point source data.

The residual contamination data will be reported primarily for unmonitored release points. Analytical data from previously monitored release points is attributed to duct holdup and **not** residual contamination. The residual contamination data may be derived from several sources of information including: previous inventory/usage surveys, interviews with current facility representatives, or current radiological survey data for a particular release point.

NOTE: The processes described in steps 20 through 23 do not need to be repeated during each usage survey update. For example, in 1996 a room contamination calculation was made for TA9-21. The circumstances have not changed since that year so that line item remained in the following year's Usage Survey Reports. Based on information from facility representatives and best health physics practices, it will be determined if these steps need to be performed/repeated during each usage survey update.

Steps to develop residual contamination data

To update residual contamination data in the survey, perform the following steps:

Step	Action
20	Identify any historic residual contamination issues (from previous inventories/survey updates). Has the status of the contamination changed (i.e., decontamination, exhaust fan turned off)? If the status has changed, evaluate the relevance of keeping the historic data in the current usage survey.

Steps continued on next page.

Review of residual contamination data, continued

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>21</td><td>Identify any current, potential residual contamination issues at the facility through interviews with facility representatives. If such issues exist, are there data available to quantify the level of contamination? Are facility or room characterization surveys and/or smear data available? If so, collect the relevant information. Quantifying residual contamination can be difficult, and estimates are not always available.</td></tr>
<tr><td>22</td><td>Using best professional judgment, do other reasons warrant a residual contamination review? If unsure, contact the Rad-NESHAP Project Leader.
<table>
<tr><th>If a residual contamination review is...</th><th>then…</th></tr>
<tr><td>Warranted</td><td>contact the facility manager and ask that a characterization or contamination survey be conducted, documented, and forwarded to MAQ. If the contamination investigation is not feasible, use best engineering judgment to estimate maximum potential residual contamination. Continue with Step 23.</td></tr>
<tr><td>not warranted</td><td>go to the next chapter of this procedure.</td></tr>
</table></td></tr>
<tr><td>23</td><td>Incorporate the residual contamination information into the current survey update. Include documentation of calculations and assumptions used to arrive at the estimate.</td></tr>
</table>

Documenting the work

Required documents

Fully document the processes for determining:

- the radioactive materials usage survey.
- the radioactive materials usage data development.

Required documentation includes:

- all survey interviews and supporting data.
- all duct holdup and residual contamination reviews and any supporting calculations OR reference the appropriate historic Usage Survey file that has this information.
- memos exchanged between MAQ and the operating groups.
- all MAQ internal memos relevant to this procedure.

Steps to document the work

To document the work, perform the following steps:

Step	Action
24	Document the results of all estimates, calculations, and communications described above.
25	Attach all supporting calculations.
26	Attach any memos prepared as a result of this procedure.
27	File documentation in the MAQ Records Room according to a schedule established by the Records Coordinator.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted to the Records Coordinator:

- Radioactive Materials Usage Survey for Point Sources and all supporting documentation
- all supporting calculations and documents
- all memos resulting from the performance of this procedure

Click here to record “self-study” training to this procedure.